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EC1806 Cedar Apple Rust

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Rust of cedar and apple trees is one of the most conspicuous and most interesting diseases in Nebraska. The symptoms on the cedar are very different from those on the apple and related species. On the other hand, the symptoms of this rust on the crab apple, hawthorne, red haw, and quince are similar to those on the apple.

Symptoms on Cedars -

Nearly every spring persons with valuable cedars become alarmed by the orange-colored, gelatinous, flower-like galls or "cedar-apples" on their trees. In some seasons there may be hundreds of these structures, varying in size from no larger than a pea to over two inches across. Usually this rust does not seriously damage the cedar unless the infection is very heavy or is serious in several successive years.

The young galls are first evident in June in the axils of the leaves. They grow rapidly during the summer and reach mature size by fall. The following spring when the first warm rains occur, usually in April or May, the galls absorb water, then gelatinous, orange-colored projections or horns push out from the depressions on the galls. In this condition the galls are very conspicuous.

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The gelatinous horns are covered with orange-colored winter spores. These winter spores germinate, producing a large number of summer spores which are forcibly discharged and carried in air currents to nearby apple trees where they cause infection of the young leaves, twigs, and fruits. The rust does not spread from one cedar tree to another or from one apple tree to another. Spread is only from the red cedar to apple trees then from the apple and related species back to the cedar. Cedars thus become infected during mid-summer when the rust is appearing on the apples.

The red cedar, Juniperus virginiana, and the closely related J. barbadensis harbor the rust during the winter and thus perpetuate the disease from season to season.

Symptoms on Apples -

Apple leaves, fruits, and occasionally twigs are attacked. Usually during June and July, and even later in wet years, orange-colored spots develop on the leaves. On the lower surface of the leaf, many cup-shaped fruiting bodies are produced on each spot; they are arranged in a ring giving a "crown-like" appearance. When the leaves are badly infected they turn yellow and premature defoliation occurs. This weakens the tree and reduces the number and size of the fruits.

The crown-like ring of cup-shaped structures may also occur on the fruits. These mar the appearance of the fruit and frequently cause a reduction in size and quality. While rust itself does not cause a rot in storage, the injuries on the fruit may serve as entrance-ways for rot-producing organisms.

On twigs of the very susceptible varieties, rust occasionally forms elongated, swollen cankers that may girdle and kill the twig.

Control -

Control may be obtained by any one of three practices, (1) spraying, (2) removal of the red cedars in the vicinity of the apples, or (3) planting the more resistant varieties.

(1) Spraying: Fermate (ferric dimethyl dithiocarbamate), a new spray material, has given satisfactory control when applied to apple trees in the pink, petal fall, and first cover sprays. Undoubtedly there will be other satisfactory spray materials with a similar chemical composition that will be released in the next year or two.

Fermate is difficult to mix with water. It is best to make a paste by stirring it in water in a bucket until all the powder is thoroughly wet before putting it in the sprayer. It is used at the rate of $1\frac{1}{2}$ lbs. per 100 gals. of water.

Fermate should not be mixed with lime, lime sulfur, or copper fungicides.

The use of sprays on cedar trees for rust control has not been adequately tested. However, the same spray mixture as used on apples may prevent infection of cedars if applied to the cedars when rust begins developing on the apple leaves. Spraying would need to be continued until the discharge of rust spores from apples has ceased. In wet seasons sprays may need to be applied at 3-week intervals from the fore part of June until late summer. Since it takes the rust galls two years to mature, sprays applied during the current season will prevent the appearance of new galls the following year. However, galls that have already formed will probably mature and produce spore horns.

Picking the galls from cedar trees will prevent the spread of rust from that tree. It is

essential that all the galls be removed and that they be removed before any spore horns are produced.

(2) Eradication: The removal of all red cedars in the vicinity of apple trees will control rust. The Nebraska Cedar Rust Law provides for the removal of rust-spreading cedars within a radius of two miles from any apple orchard containing 1,000 or more apple trees. However, over most of the state the red cedars are just as valuable as the apples and eradication of the red cedar under these conditions is often not practical. It has been found that the nearer the cedars are to the orchard the greater the danger from rust, thus a dozen infected cedars within a few rods of the orchard are a much greater menace than a hundred cedars one-half mile away.

(3) Resistant Varieties: There is considerable variation in the susceptibility of different varieties of apples to rust and resistant varieties may occasionally be rusted. In central and western Nebraska the susceptible varieties are seldom rusted severely unless located very close to cedar trees.

The varieties most commonly grown in Nebraska may be grouped as follows:

Resistant	Intermediate
Duchess	Gano or Ben Davis
Yellow Transparent	
Winesap	
Turley	Susceptible
Haralson	
Cortland	Golden Delicious
King David	Wealthy
Grimes Golden	Jonathan
Early McIntoch	Whitney Crab
Red Delicious	